

Spotify Project

February 10, 2025

1 Understanding Regional Music Preferences: South Korea vs. USA

1.1 1. Market Context: Why is Spotify Less Popular in Korea?

While Spotify dominates the US market, it only accounts for ~2% of the Korean streaming market. Possible reasons include: - Late market entry – Spotify launched in 2021, while its free tier was only introduced in 2023. - Strong local competitors – Platforms like Melon, Genie, and YouTube Music are dominant. - Cultural & industry factors – K-pop streaming strategies differ, with companies promoting their artists differently on each platform.

Source: <https://www.musicbusinessworldwide.com/spotify-launches-free-tier-in-south-korea12/>

1.2 2. Business Problem: Why does this matter for streaming platforms?

For a global music platform like Spotify, understanding regional music trends is crucial to:

- Improve personalised recommendations to suggest relevant songs and artists based on user location and preferences.
- Optimise marketing strategies to identify which artists and genres to promote in each country.
- Guide licensing and acquisitions to decide which artists, albums, or labels are worth investing in for different markets.
- Enhance content curation to create region-specific playlists to increase user engagement.

1.3 3. Objective: Comparing Music Trends in South Korea & USA

Using Spotify's Top 50 charts from South Korea and the US, we aim to: - Identify local hits vs global popular tracks. - Analyse artist distributions per country. - Compare popularity scores of artists across both regions. - Visualise data for actionable insights.

1.4 4. Solution: Data-Driven Insights for Music Trends

Step 1: Data Collection

- Use Spotify API to fetch Top 50 charts from the US and Korea.
- Extract relevant details: song name, artist, popularity, release date etc.

Step 2: Data Analysis and Visualisation

Using EDA, bar charts, KDS plots, we compare: - Track Overlap: Which songs appear in multiple countries vs. only in one? - Artist Dominance: Which artists appear more frequently in each country? - Artist Popularity: Do US and Korean artists have different popularity scores? - Release

Trends: Are Korean charts more focused on newer songs? - Album, Track Duration, and Release Date Comparison.

Step 3: Business Recommendations

- For Spotify Korea: How to grow in Korea?
- For Advertisers: What does this mean for music marketing?

2 1. Data Collection

We use the Top Tracks of 2024 playlists in Korea and US. Recently in Nov 27th 2024, Spotify has made recent API changes where new Web API use cases will no longer be able to access audio features or featured playlists (Spotify-owned editorial playlists). Therefore, I have manually created the exact US and Korea Top Tracks of 2024 playlists.

```
[360]: import base64
from requests import post, get
import json
import numpy as np
import pandas as pd
import spotipy
from spotipy.oauth2 import SpotifyClientCredentials
import matplotlib.pyplot as plt
import seaborn as sns
```

```
[414]: # Get Spotify API access
CLIENT_ID = "1b357da309fa4f6090422a4f0d9952fd"
CLIENT_SECRET = "dd5cf6c958ab485399e0ebf2313e7a96"

#Authentication
client_credentials_manager = SpotifyClientCredentials(client_id=CLIENT_ID,
↪client_secret=CLIENT_SECRET)
spotify = spotipy.Spotify(client_credentials_manager =
↪client_credentials_manager)
```

```
[416]: def get_extract(track):
    # Track ID
    track_id = track['id']

    # Track Name
    name_song = track['name']

    # Artist
    artist_uri = track['artists'][0]['uri']
    artist_name = track['artists'][0]['name']

    # Fetch artist details (to get popularity & genres)
    artist_data = spotify.artist(artist_uri)
```

```

artist_popularity = artist_data['popularity']
artist_genres = artist_data['genres']

# Album
name_album = track['album']['name']
release_date = track['album']['release_date']

# Track Length (ms)
length = track['duration_ms']

# Track Popularity
track_popularity = track['popularity']

return [track_id, name_song, name_album, artist_name, release_date, length,
↪track_popularity, artist_popularity, artist_genres]

```

```

[418]: def get_playlist(playlist_id):
        tracks = []

        # Fetch playlist tracks
        results = spotify.playlist_tracks(playlist_id)

        # Loop through the tracks
        for item in results['items']:
            track = item['track']
            if track: # Ensure track is not None
                track_info = get_extract(track) # Extract all track details
                tracks.append(track_info)

        # Convert to DataFrame with updated columns
        df = pd.DataFrame(tracks, columns=['track_id', 'song_name', 'album_name',
↪'artist_name', 'release_date',
                                         'length', 'track_popularity',
↪'artist_popularity', 'artist_genres'])

        return df

```

```

[420]: # Your playlist ID
usa_playlist_id = "41oaRH2KoPixNG0Bh1H9G9"
korea_playlist_id = "OKjfSTzxj0x642hGgPd27K"

# Get playlist data
usa_playlist = get_playlist(usa_playlist_id)
korea_playlist = get_playlist(korea_playlist_id)

```

```

[421]: usa_playlist

```

[421]:	track_id	song_name \
0	2HRqTpkrJ05ggZyyK6NPWz	Espresso
1	6AI3ezQ4o3HUoP6Dhudph3	Not Like Us
2	5fZJQrFKWQLb7FpJXZ1g7K	A Bar Song (Topsy)
3	5IZXB5IKAD2qlvTPJYDCFB	I Had Some Help (Feat. Morgan Wallen)
4	5AJ9hqTS2wcFQCELCFR07A	MILLION DOLLAR BABY
5	0WbMK4wrZ1wFSty9F7FCgu	Good Luck, Babe!
6	3xkHsmPQCBMytMJNiDf3Ii	Beautiful Things
7	6d0tVTDdiauQNBQEDotLAB	BIRDS OF A FEATHER
8	4KULAYmBBJcPRpk1y04d0G	I Remember Everything (feat. Kacey Musgraves)
9	0mflMxspEfB0VbI1kyLiAv	Stick Season
10	19XpFsce28aByvCC4g89tJ	Too Sweet
11	2tHwzyy0LoWSFqYNjeVMzj	Please Please Please
12	17phhZDn6oGtzMe56NuWvj	Lose Control
13	2tudvzsrR56uom6smg0cSf	Like That
14	3WMj8moIAXJhHsyLaqIIHI	Something in the Orange
15	40ssqCixV2Xsxd43wMIQyS	CARNIVAL
16	7K3BhSpAxZBznislVUMVtn	Last Night
17	3qhlB30KknSejmIvZZLjOD	End of Beginning
18	7KA4W4McWYRpgf0fWsJZWB	See You Again (feat. Kali Uchis)
19	1BxfuPKGuaTgP7aMOBbdwr	Cruel Summer
20	3vkCueOmm7xQDoJ17W1Pm3	My Love Mine All Mine
21	4xdBrk0nFZaP54vvZj0yx7	HOT TO GO!
22	20zhQ1SqBEmt7hmkYxfT6m	Fortnight (feat. Post Malone)
23	52eIcoLUM25zbQupAZYoFh	redrum
24	42VsgItocQw0QC3XWZ8JNA	FE!N (feat. Playboi Carti)
25	51ZQ1vr10ffzBwIjDCwqm4	we can't be friends (wait for your love)
26	7fveJ3pk1eSfxBdVkdXZ0	Cowgirls (feat. ERNEST)
27	4xhsWYTOGcal8zt0J161CU	Lovin On Me
28	1bjeWoagtHmUKputLVyDxQ	Saturn
29	2Dct3GykKZ58hpWRFfe2Qd	Heading South
30	0PAcdVzhP04gq1Iym9ESnK	Thinkin' Bout Me
31	2uqYupMHANxnwgeiXTZXzd	Austin (Boots Stop Workin')
32	3JG1uFc40wfyrqaWC7iv0e	i like the way you kiss me
33	3rUGC1vUpkDG9CZFHMur1t	greedy
34	2QjOHCTQ1Jl3zawyY0pxh6	Sweater Weather
35	4iZ4pt7kvcaH6Yo8UoZ4s2	Snooze
36	3Pbp7cUCx4d30AkZSCoNvn	Scared To Start
37	5W4kiM2cUYBJXKRudNyxjW	You Proof
38	2plbrEY59IikOBgBGLjaoe	Die With A Smile
39	3xKsf9qdS1CyvXSMEid6g8	Pink + White
40	4ZJ4vzLQekIOwntDbanNC7	Pink Skies
41	2Zo1PcszsT9WQ0ANntJbID	Feather
42	4q5YezD0IPcoLr8R81x9qy	I Can Do It With a Broken Heart
43	7F0gcfdz9Nx5V9lCNXdBYv	Red Wine Supernova
44	4QTLxavdQGUVitxAQQqkU	Mmhmm
45	7tI8dRuH2Yc6RuoTjxo4dU	Who

46 2x2olWuWXpqjoeE4b01NFS
 47 51eSHglvG1RJXtL3qI5trr
 48 5G2f63n7IPVPPjfNIGih7Q
 49 6me7F0aaZjwDo6RJ5MrfBD

Never Lose Me
 Slow It Down
 Taste
 Evergreen

	album_name	artist_name \
0	Short n' Sweet	Sabrina Carpenter
1	Not Like Us	Kendrick Lamar
2	Where I've Been, Isn't Where I'm Going	Shaboozey
3	F-1 Trillion	Post Malone
4	MILLION DOLLAR BABY	Tommy Richman
5	Good Luck, Babe!	Chappell Roan
6	Fireworks & Rollerblades	Benson Boone
7	HIT ME HARD AND SOFT	Billie Eilish
8	Zach Bryan	Zach Bryan
9	Stick Season	Noah Kahan
10	Unreal Unearth: Unaired	Hozier
11	Short n' Sweet	Sabrina Carpenter
12	I've Tried Everything But Therapy (Part 1)	Teddy Swims
13	WE DON'T TRUST YOU	Future
14	Something in the Orange	Zach Bryan
15	VULTURES 1	¥\$
16	One Thing At A Time	Morgan Wallen
17	DECIDE	Djo
18	Flower Boy	Tyler, The Creator
19	Lover	Taylor Swift
20	The Land Is Inhospitable and So Are We	Mitski
21	The Rise and Fall of a Midwest Princess	Chappell Roan
22	THE TORTURED POETS DEPARTMENT	Taylor Swift
23	american dream	21 Savage
24	UTOPIA	Travis Scott
25	eternal sunshine	Ariana Grande
26	One Thing At A Time	Morgan Wallen
27	Lovin On Me	Jack Harlow
28	Saturn	SZA
29	Heading South	Zach Bryan
30	One Thing At A Time	Morgan Wallen
31	What Happens Now?	Dasha
32	yustyna	Artemas
33	greedy	Tate McRae
34	I Love You.	The Neighbourhood
35	SOS	SZA
36	Scared To Start	Michael Marcagi
37	One Thing At A Time	Morgan Wallen
38	Die With A Smile	Lady Gaga
39	Blonde	Frank Ocean
40	Pink Skies	Zach Bryan

41	emails i can't send fwd:	Sabrina Carpenter
42	THE TORTURED POETS DEPARTMENT	Taylor Swift
43	The Rise and Fall of a Midwest Princess	Chappell Roan
44	THE BIGGEST	BigXthaPlug
45	MUSE	Jimin
46	Fine Ho, Stay	Flo Milli
47	Fireworks & Rollerblades	Benson Boone
48	Short n' Sweet	Sabrina Carpenter
49	RMCM Richy Mitch & The Coal Miners	

	release_date	length	track_popularity	artist_popularity	\
0	2024-08-23	175459	88	89	
1	2024-05-04	274192	88	93	
2	2024-05-31	171291	82	77	
3	2024-08-15	178205	83	87	
4	2024-04-26	155151	87	74	
5	2024-04-05	218423	92	84	
6	2024-04-05	180304	86	82	
7	2024-05-17	210373	96	93	
8	2023-08-25	227195	84	86	
9	2022-10-14	182346	86	83	
10	2024-08-19	251424	84	84	
11	2024-08-23	186365	85	89	
12	2023-09-15	210688	89	85	
13	2024-03-22	267706	83	90	
14	2022-04-22	228013	83	86	
15	2024-02-09	264324	81	74	
16	2023-03-03	163854	79	88	
17	2022-09-16	159245	88	73	
18	2017-07-21	180386	89	89	
19	2019-08-23	178426	88	96	
20	2023-09-15	137773	87	81	
21	2023-09-22	184841	85	84	
22	2024-04-18	228965	83	96	
23	2024-01-12	270697	81	87	
24	2023-07-28	191700	86	92	
25	2024-03-08	228639	86	91	
26	2023-03-03	181621	82	88	
27	2023-11-10	138411	81	79	
28	2024-02-22	186191	81	93	
29	2019-09-30	171692	82	86	
30	2023-03-03	177387	80	88	
31	2024-02-16	171782	84	70	
32	2024-07-11	142514	80	76	
33	2023-09-15	131872	85	84	
34	2013-04-22	240400	89	83	
35	2022-12-09	201800	87	93	

36	2024-01-12	159636	81	69
37	2023-03-03	157477	78	88
38	2024-08-16	251667	100	89
39	2016-08-20	184516	86	86
40	2024-05-24	194920	84	86
41	2023-03-17	185552	83	89
42	2024-04-18	218004	81	96
43	2023-09-22	192720	82	84
44	2023-12-01	119015	78	80
45	2024-07-19	170887	89	85
46	2024-03-15	125901	73	68
47	2024-04-05	161831	84	82
48	2024-08-23	157279	90	89
49	2017-05-17	87000	83	70

	artist_genres
0	[]
1	[hip hop, west coast hip hop]
2	[]
3	[]
4	[]
5	[]
6	[]
7	[]
8	[country, red dirt]
9	[]
10	[]
11	[]
12	[]
13	[rap]
14	[country, red dirt]
15	[]
16	[country]
17	[psychedelic pop]
18	[]
19	[]
20	[]
21	[]
22	[]
23	[]
24	[rap]
25	[pop]
26	[country]
27	[]
28	[r&b]
29	[country, red dirt]
30	[country]

```

31
32
33
34
35      [r&b]
36
37      [country]
38      [art pop, pop]
39
40      [country, red dirt]
41
42
43
44      [southern hip hop]
45      [k-pop]
46
47
48
49

```

[422]: korea_playlist

```

[422]:
      track_id      song_name \
0  7tI8dRuH2Yc6RuoTjxo4dU      Who
1  3Ua0m0YmEjrMi9XErKcNiR      Like Crazy
2  2KslE17cAJNHTsI2MI0jb2      Standing Next to You
3  2HRgqmZQCOMC7GeNuDIXHN      Seven (feat. Latto) (Explicit Ver.)
4  6qafqn8bBMy7t5c5WqpyRk      Closer Than This
5  21ewxM3YvcdTj7cC0Xwzn0      Do or Die
6  2NOSPREDYqILVEFSsWF5N5      Love Me Again
7  01qFKNWq73UfEs1IOGvumE      3D (feat. Jack Harlow)
8  4WUpMUjdoi47LY7gBQBXe3      Grain of Sand
9  0u8rZGtXJrLtiSe34FPjGG      Like Crazy (English Version)
10 3LWVXp636uLT356Rj08Jaz      Be Mine
11 3vnaEaDxMKdBhqA1tOuAw1      Warmth
12 2PlsVMcOn6ujc2UEYs2Yat      Home
13 0PBT1Q84CBJF0tBnKGmQa6      FRI(END)S
14 6auT8cRBu3BgPRBrdVBY15      London Boy
15 59hBR0BCtJsfIbV9VzCVAp      Set Me Free Pt.2
16 1agDCV4zQqaFwJQNsTgmL1  Smeraldo Garden Marching Band (feat. Loco)
17 1aKvZDoLGkNMxoRYgkckZG      Magnetic
18 74X2u8JMVooG2QbjRxXwR8      Perfect Night
19 2tA3NP12r4niSRhb9Y6AoY      Polaroid
20 2VdSktBqFfkW7y6q5Ik4Z4      Supernova
21 38tXZcL1gZRfbqf0GOVMTH      How Sweet
22 5h1BN75CEh8wdSwE1xrbSe      Slow Dancing
23 2RLdkXSaiQjRbey5pvP8Kt      If We Ever Meet Again

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24	2nRMW95dn0ILirpbksLTs	Never Let Go
25	0JLcfQTtEf3Whtj590hSOf	APT.
26	5ocSQW5sIUIOFojwXEz9Ki	Supernatural
27	204Bb2Wckj1TP08270nBMI	EASY
28	50xSycnGMDy0Wg5jJc0v3S	Rainbow
29	2jidjmWNeRmKgLjXhW52Gz	Our Blues, Our Life
30	5eWcGfUCrVFMoYskyfkEPE	Armageddon
31	3d2bsbugow8JiNvuaRupFH	Slow Dance (feat. Sofia Carson)
32	7gMfVc4zfNixuMyMGgl0Ha	Rebirth (Intro)
33	5sdQ0yqq2IDhvmx2lH0pwd	Super Shy
34	19D8LNpWwIPpi6hs9BG7dq	Bubble Gum
35	4Cr43xPo7bwyCcL1g3yVCu	A bientot
36	0aZG8KWrprNsGL0loUkfSj	plot twist
37	2gkVEnpahpE3bQuvGuCpAV	Yes or No
38	3lwK3WyKAI5bUuGY10gGbZ	Smart
39	1SS0WlKhJewviwEDZ6dWj0	SPOT!
40	39gaUtq2z4ejJbno7tWHbL	T.B.H
41	5XWlyfo0kZ8LF7VSyfS4Ew	Drama
42	56v8WEnGzLByGsDAXDiv4d	ETA
43	3r8RuvgbX9s7ammBn07D3W	Ditto
44	0a4MMMyCrzT0En247IhqZbD	Hype Boy
45	6rdkCkjk6D12xRpdMXy0I2	New Jeans
46	2gyCwr0cC6JBoaJ8JGJ7T8	To. X
47	4bjN59DRXFRxBE1g5ne6B1	Haegeum
48	45zLrK0668WQ5JFMyiYmCS	Interlude : Showtime
49	0EhdXt3y460mTRsi97Pyk5	

	album_name	artist_name	release_date	length	\
0	MUSE	Jimin	2024-07-19	170887	
1	FACE	Jimin	2023-03-24	212241	
2	GOLDEN	Jung Kook	2023-11-03	206019	
3	GOLDEN	Jung Kook	2023-11-03	183550	
4	MUSE	Jimin	2024-07-19	223301	
5	Do or Die	Lim Young Woong	2023-10-09	205440	
6	Layover	V	2023-08-11	182293	
7	3D : The Remixes	Jung Kook	2023-10-02	201812	
8	Grain of Sand	Lim Young Woong	2023-06-05	220309	
9	FACE	Jimin	2023-03-24	212253	
10	MUSE	Jimin	2024-07-19	207347	
11	Warmth	Lim Young Woong	2024-05-06	235053	
12	Warmth	Lim Young Woong	2024-05-06	235333	
13	FRI(END)S	V	2024-03-15	148082	
14	Polaroid	Lim Young Woong	2022-11-15	244500	
15	Set Me Free Pt.2	Jimin	2023-03-17	200929	
16	MUSE	Jimin	2024-07-19	182840	
17	SUPER REAL ME	ILLIT	2024-03-25	160688	
18	Perfect Night	LE SSERAFIM	2023-10-27	159080	

19		Polaroid	Lim Young Woong	2022-11-15	206400
20	Armageddon - The 1st Album		aespa	2024-05-27	178880
21		How Sweet	NewJeans	2024-05-24	219026
22		Layover	V	2023-09-08	187026
23		IM HERO	Lim Young Woong	2022-05-02	274386
24		Never Let Go	Jung Kook	2024-06-07	166812
25		rosie	ROSÉ	2024-12-06	169917
26		Supernatural	NewJeans	2024-06-21	191000
27		EASY	LE SSERAFIM	2024-02-19	164545
28		IM HERO	Lim Young Woong	2022-05-02	196400
29		IM HERO	Lim Young Woong	2022-05-02	207386
30	Armageddon - The 1st Album		aespa	2024-05-27	196466
31		MUSE	Jimin	2024-07-19	188399
32		MUSE	Jimin	2024-07-19	144624
33		NewJeans 'Super Shy'	NewJeans	2023-07-07	154666
34		How Sweet	NewJeans	2024-05-24	200266
35		IM HERO	Lim Young Woong	2022-05-02	256372
36	TWS 1st Mini Album 'Sparkling Blue'		TWS	2024-01-22	152400
37		GOLDEN	Jung Kook	2023-11-03	147557
38		Smart (Remixes)	LE SSERAFIM	2024-03-22	166384
39		SPOT!	ZICO	2024-04-26	167706
40		1st Mini Album 'MANITO'	QWER	2024-04-01	175880
41	Drama - The 4th Mini Album		aespa	2023-11-10	214973
42		NewJeans 2nd EP 'Get Up'	NewJeans	2023-07-21	151373
43		Ditto	NewJeans	2022-12-19	185506
44	NewJeans 1st EP 'New Jeans'		NewJeans	2022-08-01	179026
45		NewJeans 'Super Shy'	NewJeans	2023-07-07	108986
46	To. X - The 5th Mini Album		TAEYEON	2023-11-27	170386
47		D-DAY	Agust D	2023-04-21	168926
48		MUSE	Jimin	2024-07-19	78492
49		The Book of Us : Gravity	DAY6	2019-07-15	205575

	track_popularity	artist_popularity	artist_genres
0	89	85	[k-pop]
1	74	85	[k-pop]
2	85	84	[k-pop]
3	84	84	[k-pop]
4	69	85	[k-pop]
5	60	61	[k-ballad]
6	76	81	[k-pop]
7	78	84	[k-pop]
8	59	61	[k-ballad]
9	63	85	[k-pop]
10	75	85	[k-pop]
11	63	61	[k-ballad]
12	62	61	[k-ballad]
13	79	81	[k-pop]

14	58	61	[k-ballad]
15	67	85	[k-pop]
16	69	85	[k-pop]
17	82	73	[k-pop]
18	77	78	[k-pop]
19	56	61	[k-ballad]
20	70	79	[k-pop]
21	76	78	[k-pop]
22	75	81	[k-pop]
23	55	61	[k-ballad]
24	73	84	[k-pop]
25	54	86	[k-pop]
26	76	78	[k-pop]
27	75	78	[k-pop]
28	53	61	[k-ballad]
29	54	61	[k-ballad]
30	71	79	[k-pop]
31	73	85	[k-pop]
32	71	85	[k-pop]
33	77	78	[k-pop]
34	71	78	[k-pop]
35	52	61	[k-ballad]
36	68	61	[k-pop]
37	75	84	[k-pop]
38	74	78	[k-pop]
39	76	63	[k-rap, k-pop]
40	59	53	[k-rock, k-pop]
41	78	79	[k-pop]
42	76	78	[k-pop]
43	77	78	[k-pop]
44	76	78	[k-pop]
45	76	78	[k-pop]
46	65	65	[k-pop, k-ballad]
47	83	73	[k-pop, k-rap]
48	69	85	[k-pop]
49	54	67	[k-rock, k-pop]

```
[439]: # save dataset
usa_playlist.to_csv("usa_playlist.csv", index = True)
korea_playlist.to_csv("korea_playlist.csv", index = True)
```

```
[16]: # import dataset
usa_playlist = pd.read_csv("usa_playlist.csv")
korea_playlist = pd.read_csv("korea_playlist.csv")
```

```
[18]: # cleaning dataset
usa_playlist.iloc[:, 0] = usa_playlist.iloc[:, 0] + 1
```

```

usa_playlist.rename(columns={usa_playlist.columns[0]: "ranking"}, inplace=True)

korea_playlist.iloc[:, 0] = korea_playlist.iloc[:, 0] + 1
korea_playlist.rename(columns={korea_playlist.columns[0]: "ranking"},
↳inplace=True)

```

```

[20]: usa_playlist.drop("track_id", axis = 1, inplace = True)
korea_playlist.drop("track_id", axis = 1, inplace = True)

```

```

[22]: usa_playlist['release_date'] = pd.to_datetime(usa_playlist['release_date'])
usa_playlist['year'] = usa_playlist['release_date'].dt.year
usa_playlist['month'] = usa_playlist['release_date'].dt.month

korea_playlist['release_date'] = pd.to_datetime(korea_playlist['release_date'])
korea_playlist['year'] = korea_playlist['release_date'].dt.year
korea_playlist['month'] = korea_playlist['release_date'].dt.month

```

```

[24]: usa_playlist['length'] = usa_playlist['length']/1000
korea_playlist['length'] = korea_playlist['length']/1000
usa_playlist.rename(columns={'length': "length_sec"}, inplace=True)
korea_playlist.rename(columns={'length': "length_sec"}, inplace=True)

```

```

[30]: usa_playlist

```

```

[30]:
   ranking  song_name \
0         1      Espresso
1         2    Not Like Us
2         3  A Bar Song (Topsy)
3         4  I Had Some Help (Feat. Morgan Wallen)
4         5  MILLION DOLLAR BABY
5         6    Good Luck, Babe!
6         7    Beautiful Things
7         8  BIRDS OF A FEATHER
8         9  I Remember Everything (feat. Kacey Musgraves)
9        10    Stick Season
10        11      Too Sweet
11        12  Please Please Please
12        13    Lose Control
13        14    Like That
14        15  Something in the Orange
15        16      CARNIVAL
16        17    Last Night
17        18  End of Beginning
18        19  See You Again (feat. Kali Uchis)
19        20    Cruel Summer
20        21  My Love Mine All Mine
21        22    HOT TO GO!

```

22	23	Fortnight (feat. Post Malone)
23	24	redrum
24	25	FE!N (feat. Playboi Carti)
25	26	we can't be friends (wait for your love)
26	27	Cowgirls (feat. ERNEST)
27	28	Lovin On Me
28	29	Saturn
29	30	Heading South
30	31	Thinkin' Bout Me
31	32	Austin (Boots Stop Workin')
32	33	i like the way you kiss me
33	34	greedy
34	35	Sweater Weather
35	36	Snooze
36	37	Scared To Start
37	38	You Proof
38	39	Die With A Smile
39	40	Pink + White
40	41	Pink Skies
41	42	Feather
42	43	I Can Do It With a Broken Heart
43	44	Red Wine Supernova
44	45	Mmhmm
45	46	Who
46	47	Never Lose Me
47	48	Slow It Down
48	49	Taste
49	50	Evergreen

	album_name	artist_name \
0	Short n' Sweet	Sabrina Carpenter
1	Not Like Us	Kendrick Lamar
2	Where I've Been, Isn't Where I'm Going	Shaboozey
3	F-1 Trillion	Post Malone
4	MILLION DOLLAR BABY	Tommy Richman
5	Good Luck, Babe!	Chappell Roan
6	Fireworks & Rollerblades	Benson Boone
7	HIT ME HARD AND SOFT	Billie Eilish
8	Zach Bryan	Zach Bryan
9	Stick Season	Noah Kahan
10	Unreal Unearth: Unaired	Hozier
11	Short n' Sweet	Sabrina Carpenter
12	I've Tried Everything But Therapy (Part 1)	Teddy Swims
13	WE DON'T TRUST YOU	Future
14	Something in the Orange	Zach Bryan
15	VULTURES 1	¥\$
16	One Thing At A Time	Morgan Wallen

17	DECIDE	Djo
18	Flower Boy	Tyler, The Creator
19	Lover	Taylor Swift
20	The Land Is Inhospitable and So Are We	Mitski
21	The Rise and Fall of a Midwest Princess	Chappell Roan
22	THE TORTURED POETS DEPARTMENT	Taylor Swift
23	american dream	21 Savage
24	UTOPIA	Travis Scott
25	eternal sunshine	Ariana Grande
26	One Thing At A Time	Morgan Wallen
27	Lovin On Me	Jack Harlow
28	Saturn	SZA
29	Heading South	Zach Bryan
30	One Thing At A Time	Morgan Wallen
31	What Happens Now?	Dasha
32	yustyna	Artemas
33	greedy	Tate McRae
34	I Love You.	The Neighbourhood
35	SOS	SZA
36	Scared To Start	Michael Marcagi
37	One Thing At A Time	Morgan Wallen
38	Die With A Smile	Lady Gaga
39	Blonde	Frank Ocean
40	Pink Skies	Zach Bryan
41	emails i can't send fwd:	Sabrina Carpenter
42	THE TORTURED POETS DEPARTMENT	Taylor Swift
43	The Rise and Fall of a Midwest Princess	Chappell Roan
44	THE BIGGEST	BigXthaPlug
45	MUSE	Jimin
46	Fine Ho, Stay	Flo Milli
47	Fireworks & Rollerblades	Benson Boone
48	Short n' Sweet	Sabrina Carpenter
49	RMCM	Richy Mitch & The Coal Miners

	release_date	length_sec	track_popularity	artist_popularity	\
0	2024-08-23	175.459	88	89	
1	2024-05-04	274.192	87	93	
2	2024-05-31	171.291	82	77	
3	2024-08-15	178.205	83	87	
4	2024-04-26	155.151	87	74	
5	2024-04-05	218.423	92	84	
6	2024-04-05	180.304	86	82	
7	2024-05-17	210.373	96	93	
8	2023-08-25	227.195	84	86	
9	2022-10-14	182.346	86	83	
10	2024-08-19	251.424	84	84	
11	2024-08-23	186.365	85	89	

12	2023-09-15	210.688	89	85
13	2024-03-22	267.706	83	90
14	2022-04-22	228.013	83	86
15	2024-02-09	264.324	81	74
16	2023-03-03	163.854	79	88
17	2022-09-16	159.245	88	73
18	2017-07-21	180.386	89	89
19	2019-08-23	178.426	88	96
20	2023-09-15	137.773	87	81
21	2023-09-22	184.841	85	84
22	2024-04-18	228.965	83	96
23	2024-01-12	270.697	81	87
24	2023-07-28	191.700	86	92
25	2024-03-08	228.639	86	91
26	2023-03-03	181.621	82	88
27	2023-11-10	138.411	81	79
28	2024-02-22	186.191	81	93
29	2019-09-30	171.692	82	86
30	2023-03-03	177.387	80	88
31	2024-02-16	171.782	84	70
32	2024-07-11	142.514	80	76
33	2023-09-15	131.872	85	84
34	2013-04-22	240.400	89	83
35	2022-12-09	201.800	87	93
36	2024-01-12	159.636	81	69
37	2023-03-03	157.477	78	88
38	2024-08-16	251.667	100	89
39	2016-08-20	184.516	86	86
40	2024-05-24	194.920	84	86
41	2023-03-17	185.552	83	89
42	2024-04-18	218.004	81	96
43	2023-09-22	192.720	82	84
44	2023-12-01	119.015	78	80
45	2024-07-19	170.887	90	85
46	2024-03-15	125.901	73	68
47	2024-04-05	161.831	84	82
48	2024-08-23	157.279	90	89
49	2017-05-17	87.000	83	70

	artist_genres	year	month
0	[]	2024	8
1	['hip hop', 'west coast hip hop']	2024	5
2	[]	2024	5
3	[]	2024	8
4	[]	2024	4
5	[]	2024	4
6	[]	2024	4

7		[]	2024	5
8	['country', 'red dirt']		2023	8
9		[]	2022	10
10		[]	2024	8
11		[]	2024	8
12		[]	2023	9
13		['rap']	2024	3
14	['country', 'red dirt']		2022	4
15		[]	2024	2
16		['country']	2023	3
17	['psychedelic pop']		2022	9
18		[]	2017	7
19		[]	2019	8
20		[]	2023	9
21		[]	2023	9
22		[]	2024	4
23		[]	2024	1
24		['rap']	2023	7
25		['pop']	2024	3
26		['country']	2023	3
27		[]	2023	11
28		['r&b']	2024	2
29	['country', 'red dirt']		2019	9
30		['country']	2023	3
31		[]	2024	2
32		[]	2024	7
33		[]	2023	9
34		[]	2013	4
35		['r&b']	2022	12
36		[]	2024	1
37		['country']	2023	3
38	['art pop', 'pop']		2024	8
39		[]	2016	8
40	['country', 'red dirt']		2024	5
41		[]	2023	3
42		[]	2024	4
43		[]	2023	9
44	['southern hip hop']		2023	12
45		['k-pop']	2024	7
46		[]	2024	3
47		[]	2024	4
48		[]	2024	8
49		[]	2017	5

Genres are missing for some artists, so we ignore the genre variable.

3 2. Data Analysis

Song Overlap Analysis

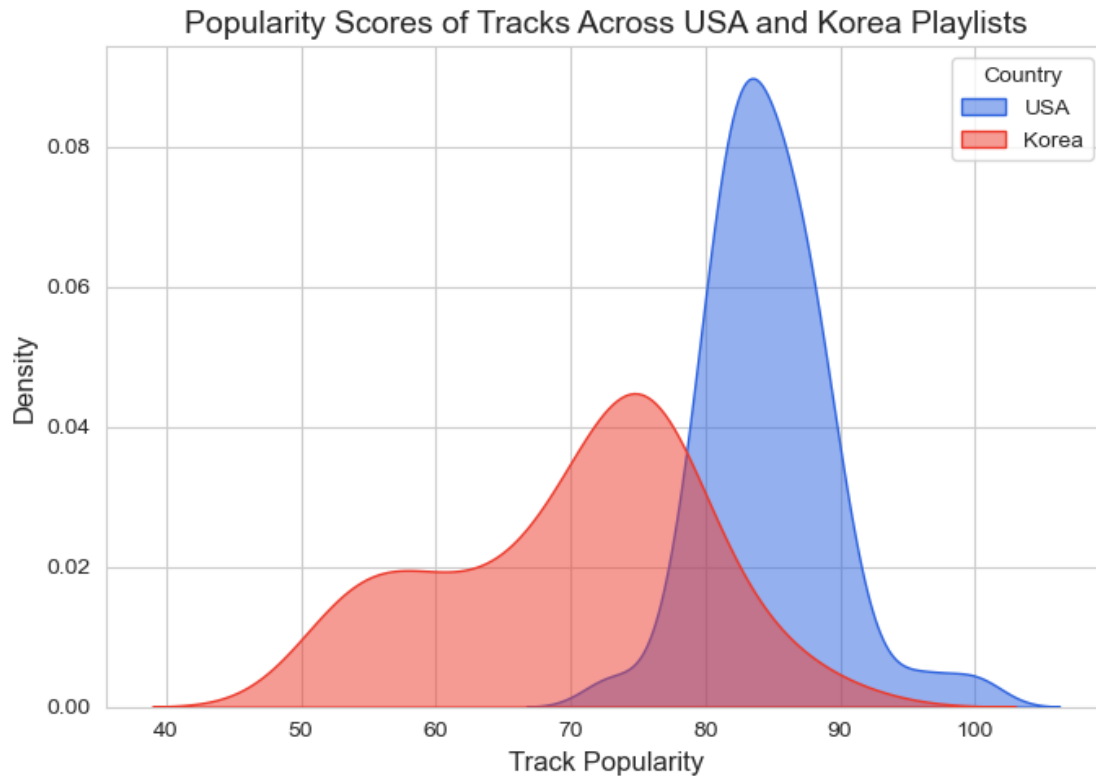
```
[57]: overlapping_songs = usa_playlist[usa_playlist['song_name'].
      ↪isin(korea_playlist['song_name'])]
      overlapping_songs
```

```
[57]:      ranking song_name album_name artist_name release_date  length_sec  \
45         46         Who         MUSE         Jimin   2024-07-19    170.887

      track_popularity  artist_popularity artist_genres  year  month
45                 90                 85    ['k-pop']  2024     7
```

- We analysed the Top 50 Spotify charts for the US and South Korea to identify songs that appear in both countries.
- Only one overlaps: ‘Who’ by Jimin (a K-pop artist).
- This suggests that Spotify’s Top 50 charts are highly region-specific, with almost no crossover between the two markets. This highlights the distinct listening preferences in each country.

```
[261]: plt.figure(figsize = (7, 5))
      plt.title('Popularity Scores of Tracks Across USA and Korea Playlists',
      ↪fontsize = 14)
      # USA plot
      sns.kdeplot(x=usa_playlist['track_popularity'], color='#2d63df', fill = True,
      ↪alpha=0.5, linewidth=1, label='USA')
      sns.kdeplot(x=korea_playlist['track_popularity'], color='#ed392b', fill = True,
      ↪alpha=0.5, linewidth=1, label='Korea')
      plt.xlabel('Track Popularity', fontsize=12)
      plt.ylabel('Density', fontsize=12)
      plt.legend(title='Country', fontsize=10)
      plt.tight_layout()
      plt.show()
```



- The tracks in the US playlist generally show higher popularity, with scores predominantly ranging from 70 to 100. The majority of tracks peak in the 80-90 range, indicating strong overall engagement. This suggests that US tracks are highly popular, with consistent listener interaction across multiple songs.
- In contrast, the tracks in the Korean playlist tend to have lower popularity scores, with most tracks falling within the 50-90 range. Popularity scores peak between 70 and 80. This may reflect a more concentrated distribution of popularity, with a few tracks gaining higher scores while others are relatively less popular.

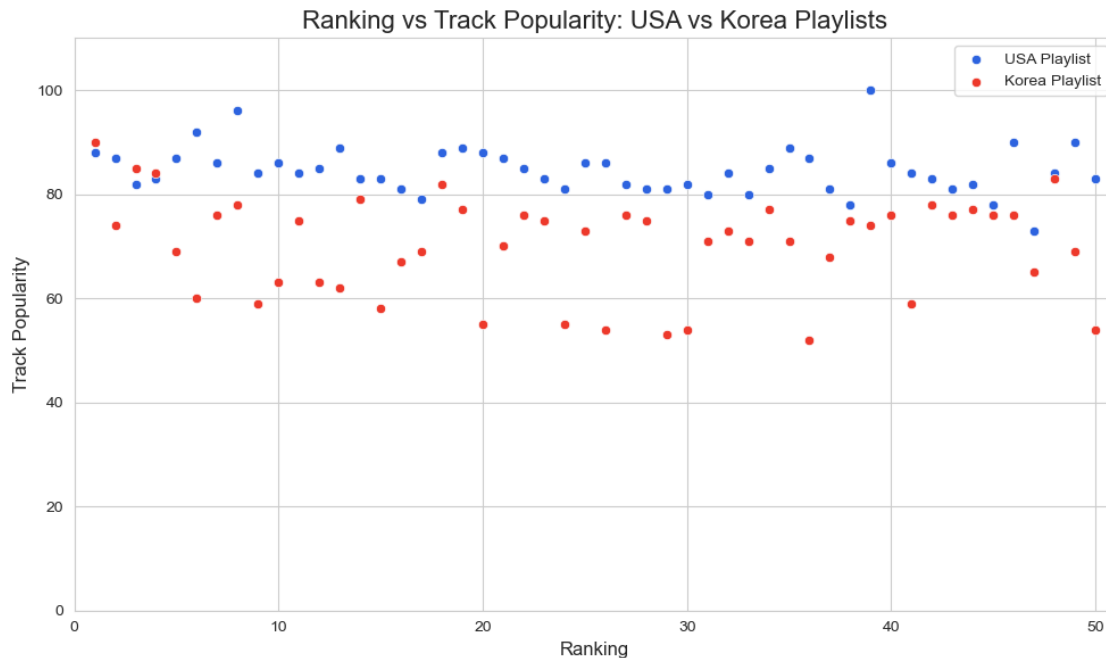
```
[368]: plt.figure(figsize=(10, 6))

sns.scatterplot(x='ranking', y='track_popularity', data=usa_playlist,
               ↪color='#2d63df', label='USA Playlist')
sns.scatterplot(x='ranking', y='track_popularity', data=korea_playlist,
               ↪color='#ed392b', label='Korea Playlist')
plt.title('Ranking vs Track Popularity: USA vs Korea Playlists', fontsize=16)
plt.xlabel('Ranking', fontsize=12)
plt.ylabel('Track Popularity', fontsize=12)

plt.xlim(0, max(usa_playlist['ranking'].max(), korea_playlist['ranking'].max()),
        ↪+ 1)
```

```
plt.ylim(0, max(usa_playlist['track_popularity'].max(),
↳korea_playlist['track_popularity'].max()) + 10) #

plt.legend()
plt.tight_layout()
plt.show()
```



- The lack of correlation between ranking and track popularity suggests that ranking might not be a perfect indicator of how popular a track is on Spotify, or there could be other factors influencing the rankings.
- A track's popularity might have increased recently but still be ranked low due to it being relatively new. Conversely, a track with a high ranking could be one that has been around for a while, maintaining its ranking due to sustained interest even if its current popularity has dropped.

Artist Dominance Analysis

```
[249]: sns.set_style("whitegrid")
# Filter the dataset to include only artists > 1
usa_filtered_artists = usa_playlist['artist_name'].value_counts()
usa_filtered_artists = usa_filtered_artists[usa_filtered_artists > 1]
korea_filtered_artists = korea_playlist['artist_name'].value_counts()
korea_filtered_artists = korea_filtered_artists[korea_filtered_artists > 1]

fig, ax = plt.subplots(2, 1, figsize = (6, 7))
```

```

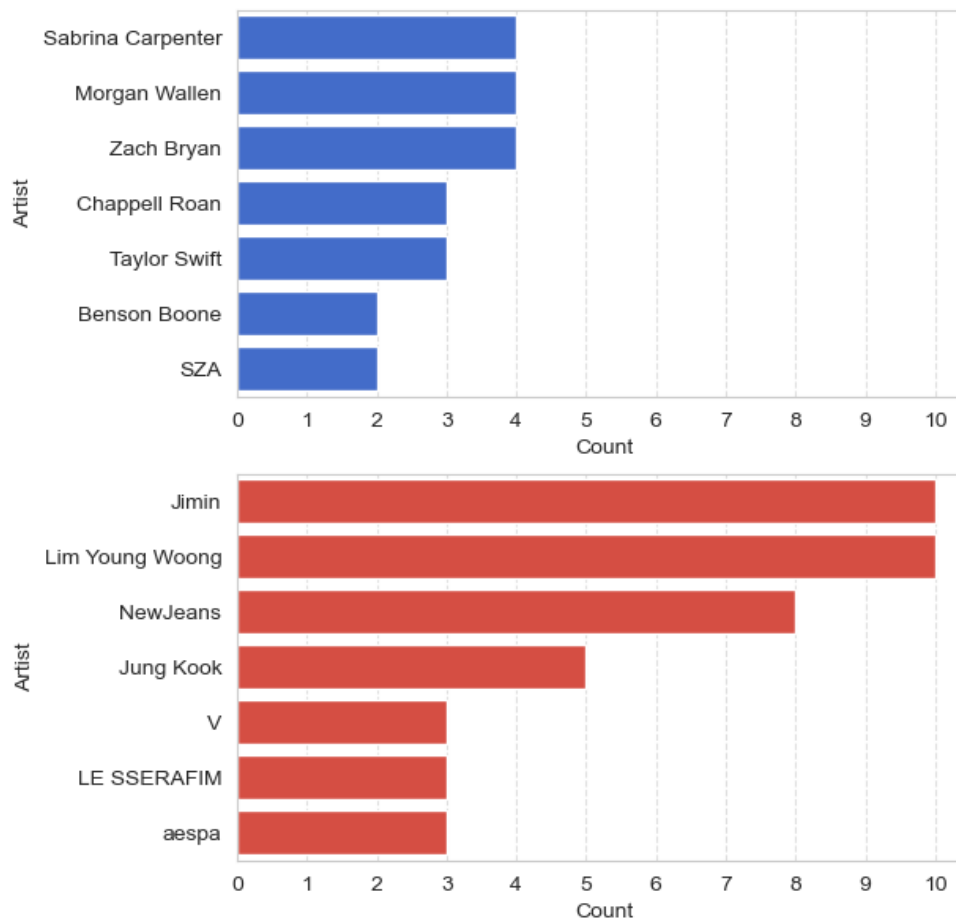
fig.suptitle('Counts of Artists with Multiple Tracks Listed in USA and Korea_
↳Playlists', fontsize=15)

# USA plot
sns.countplot(y=usa_playlist['artist_name'], order=usa_filtered_artists.index,
↳ax=ax[0], color='#2d63df')
ax[0].set_xticks(np.arange(0, 11, step=1))
ax[0].set_xlabel('Count', fontsize=10)
ax[0].set_ylabel('Artist', fontsize=10)
ax[0].set_xlim(0, 10.5)
ax[0].grid(True, axis='x', linestyle='--', alpha=0.6)

sns.countplot(y=korea_playlist['artist_name'], order=korea_filtered_artists.
↳index, ax=ax[1], color='#ed392b')
ax[1].set_xticks(np.arange(0, 11, step=1))
ax[1].set_xlabel('Count', fontsize=10)
ax[1].set_ylabel('Artist', fontsize=10)
ax[1].set_xlim(0, 10.5)
ax[1].grid(True, axis='x', linestyle='--', alpha=0.6)

```

Counts of Artists with Multiple Tracks Listed in USA and Korea Playlists



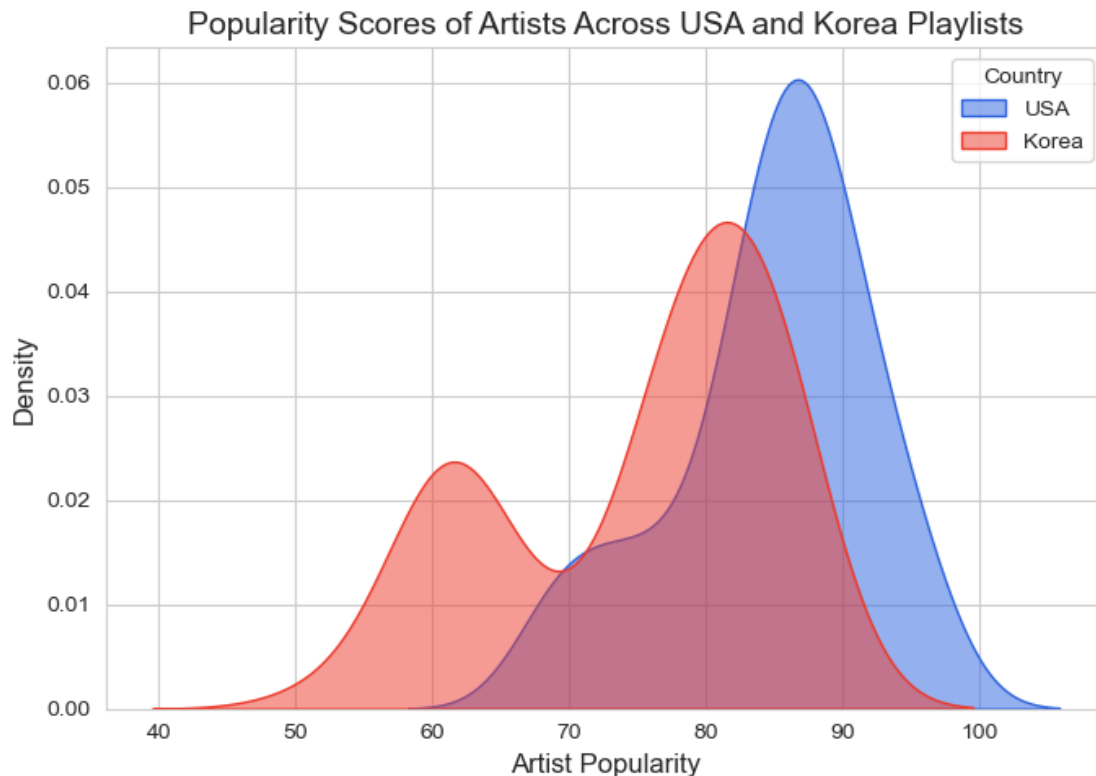
1. Artist Range in US Playlist: - The US playlist has a diverse set of artists, with a wide range of track counts suggesting a variety of artists contributing to the top tracks. - The highest number of tracks attributed to a single artist is 4, indicating a less concentrated artist distribution.

2. Artist Range in Korea Playlist: - The Korean playlist shows a skewed distribution with a small group of artists dominating the tracks. Notable, Jimin, Lim Young Woong, and NewJeans represent a substantial portion of the list. - **BTS's dominance:** Tracks by Jimin, Jung Kook, and V from BTS collectively makes up 18 out of 50 tracks, pointing to the huge BTS fanbase on Spotify. BTS's tracks account for a large chunk of the playlist, revealing the deep influence of the group on the Korean streaming audience. - **Lim Young Woong's Popularity:** Lim Young Woong, a famous trot singer in Korea has an impressive presence in the playlist. Trot music, popular among older demographics, contrasts with the mainstream appeal of K-pop, which typically attracts younger listeners. Lim Young Woong's popularity on Spotify, a platform often associated with younger audiences, may reflect an increasing adoption of the service among older South Korean listeners. This trend suggests that Spotify's user base in Korea is expanding beyond its initial young demographic.

Artist Popularity

Compare popularity scores of artists across both regions.

```
[263]: plt.figure(figsize = (7, 5))
plt.title('Popularity Scores of Artists Across USA and Korea Playlists',
         ↪fontsize = 14)
# USA plot
sns.kdeplot(x=usa_playlist['artist_popularity'], color='#2d63df', fill = True,
         ↪alpha=0.5, linewidth=1, label='USA')
sns.kdeplot(x=korea_playlist['artist_popularity'], color='#ed392b', fill =
         ↪True, alpha=0.5, linewidth=1, label='Korea')
plt.xlabel('Artist Popularity', fontsize=12)
plt.ylabel('Density', fontsize=12)
plt.legend(title='Country', fontsize=10)
plt.tight_layout()
plt.show()
```



- Artists in the US playlist generally show higher popularity, with scores ranging from 60 to 100. The majority of artists' popularity peaks in the late 80s, suggesting that many artists in the US playlist are well-established and consistently popular.
- In contrast, the popularity scores for artists in the Korea playlist are more varied, ranging from 50 to 90. There are two distinct peaks: one around 70 and another around 85. This dual

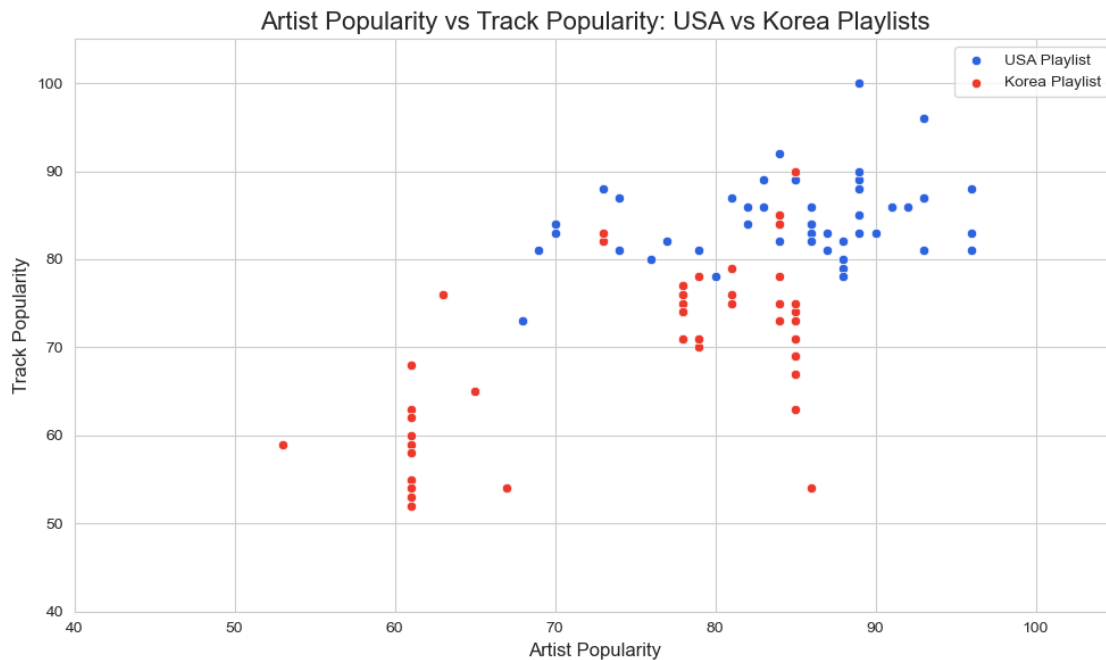
peak could indicate the dominance of a few artists, such as Jimin and Lim Young Woong, who have a significant presence in the playlist. These artists likely drive up the popularity score, while other artists contribute to the broader distribution of popularity.

```
[390]: plt.figure(figsize=(10, 6))

sns.scatterplot(x='artist_popularity', y='track_popularity', data=usa_playlist,
               color='#2d63df', label='USA Playlist')
sns.scatterplot(x='artist_popularity', y='track_popularity',
               data=korea_playlist, color='#ed392b', label='Korea Playlist')
plt.title('Artist Popularity vs Track Popularity: USA vs Korea Playlists',
        fontsize=16)
plt.xlabel('Artist Popularity', fontsize=12)
plt.ylabel('Track Popularity', fontsize=12)

plt.xlim(40, 105)
plt.ylim(40, 105)

plt.legend()
plt.tight_layout()
plt.show()
```



- There seem to be some correlation for Track Popularity and Artist Popularity, meaning that more popular artists tend to have more popular tracks.
- However, this isn't always perfect. There seems to be cases where popular artists have less popular tracks.

Album Analysis

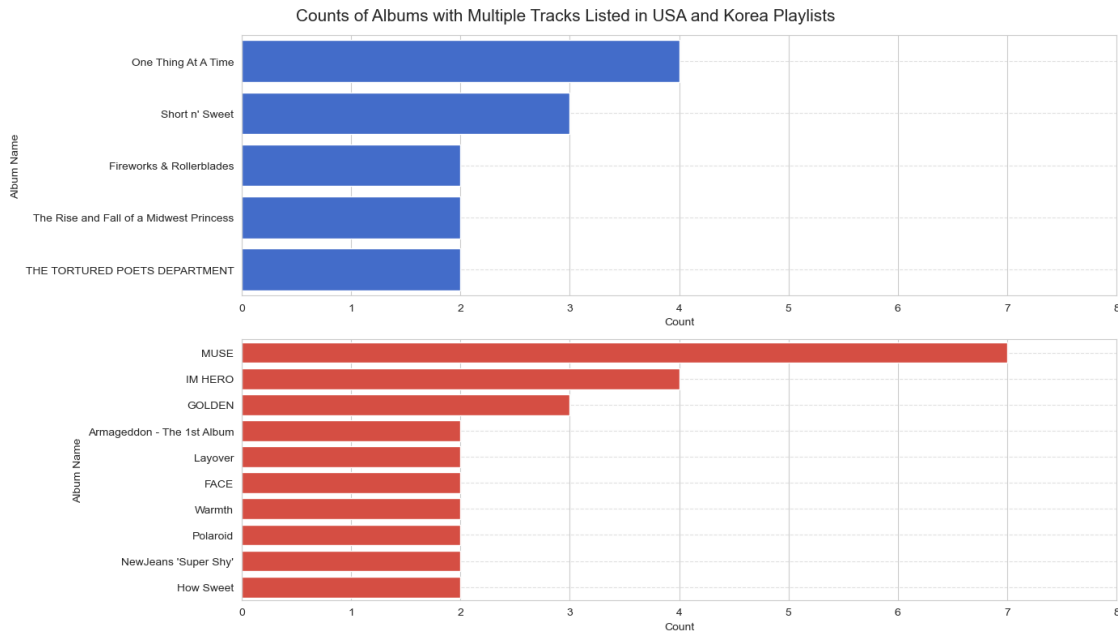
```
[319]: # Filter the dataset to include only albums > 1
usa_filtered_albums = usa_playlist['album_name'].value_counts()
usa_filtered_albums = usa_filtered_albums[usa_filtered_albums > 1]
korea_filtered_albums = korea_playlist['album_name'].value_counts()
korea_filtered_albums = korea_filtered_albums[korea_filtered_albums > 1]

fig, ax = plt.subplots(2, 1, figsize = (14, 8))
fig.suptitle('Counts of Albums with Multiple Tracks Listed in USA and Korea_
↳Playlists', fontsize=15)

# USA plot
sns.countplot(y=usa_playlist['album_name'], order=usa_filtered_albums.index,
↳ax=ax[0], color='#2d63df')
ax[0].set_xlabel('Count', fontsize=10)
ax[0].set_xticks(np.arange(0, 8.5, step=1))
ax[0].set_ylabel('Album Name', fontsize=10)
ax[0].grid(True, axis='y', linestyle='--', alpha=0.6)

# Korea plot
sns.countplot(y=korea_playlist['album_name'], order=korea_filtered_albums.
↳index, ax=ax[1], color='#ed392b')
ax[1].set_xlabel('Count', fontsize=10)
ax[1].set_xticks(np.arange(0, 8.5, step=1))
ax[1].set_ylabel('Album Name', fontsize=10)
ax[1].grid(True, axis='y', linestyle='--', alpha=0.6)

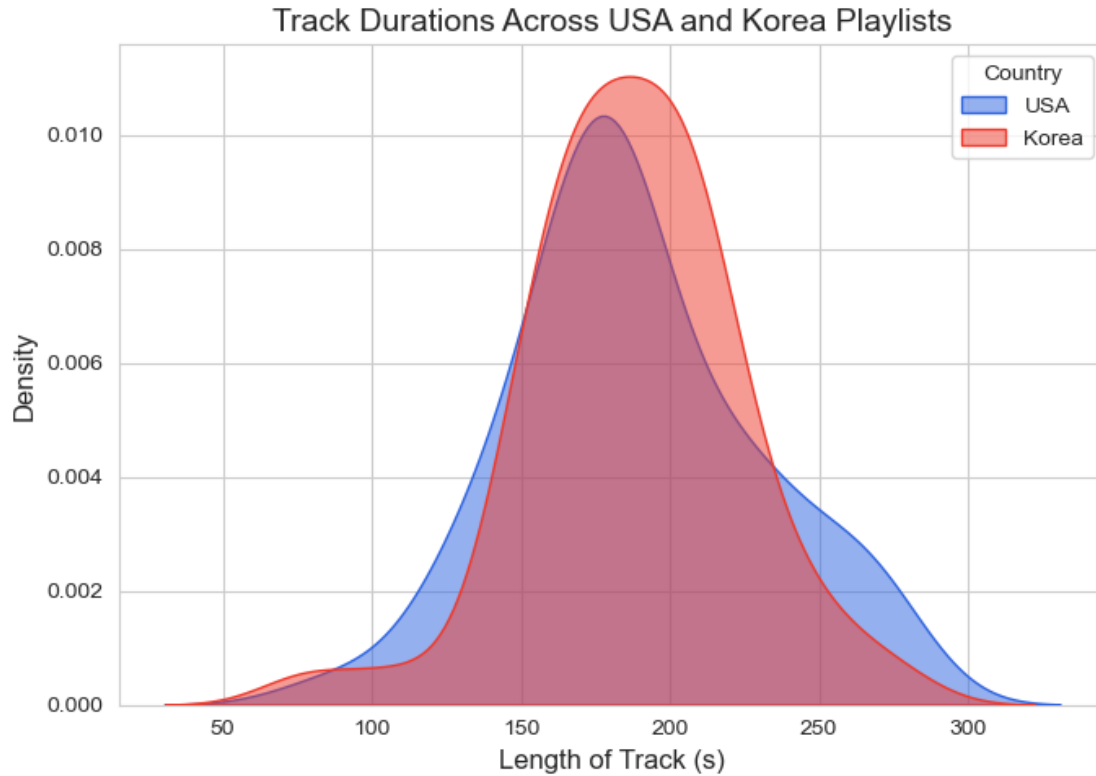
plt.tight_layout()
plt.show()
```

- The US playlist contains a more diverse set of albums, with fewer albums having multiple tracks listed.
- The tracks in the Korea playlist are sourced from fewer albums, with some albums (like Jimin's MUSE) having a significant number of tracks.
- The dominance of albums like MUSE could reflect the popularity of K-pop and specific artists (such as Jimin) in the Korean market, which contrasts with the variety in the US playlist where multiple genres and artists are more evenly distributed.

Track Duration

```
[331]: plt.figure(figsize = (7, 5))
plt.title('Track Durations Across USA and Korea Playlists', fontsize = 14)
# USA plot
sns.kdeplot(x=usa_playlist['length_sec'], color='#2d63df', fill = True, alpha=0.
↪5, linewidth=1, label='USA')
sns.kdeplot(x=korea_playlist['length_sec'], color='#ed392b', fill = True,
↪alpha=0.5, linewidth=1, label='Korea')
plt.xlabel('Length of Track (s)', fontsize=12)
plt.ylabel('Density', fontsize=12)
plt.legend(title='Country', fontsize=10)
plt.tight_layout()
plt.show()
```



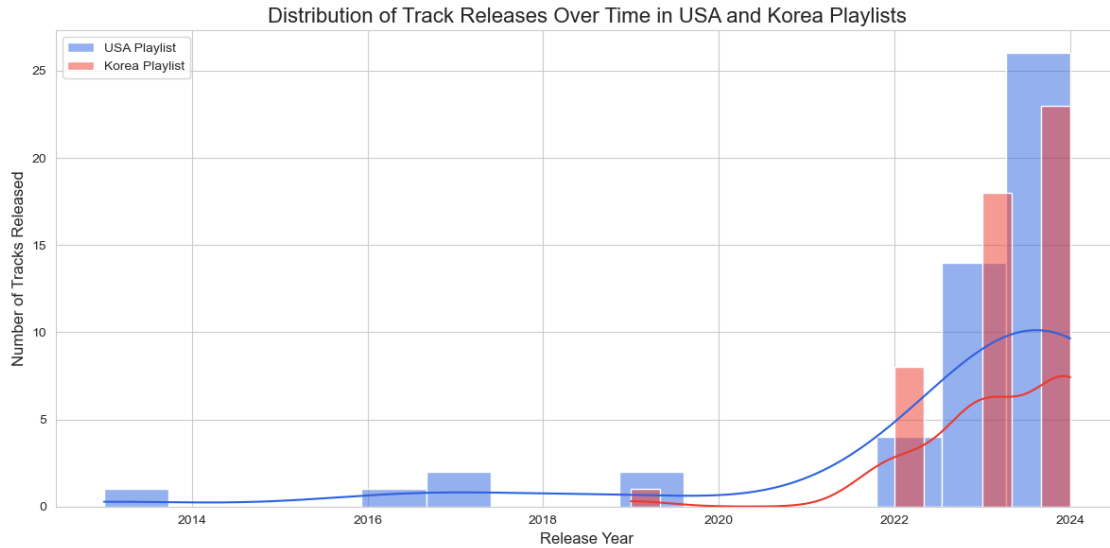
- We observe that there isn't a significant difference in the overall duration of tracks between the two countries. Both playlists show a similar trend where the majority of tracks hover around 170 seconds (around 3 minutes).

Release Date

```
[351]: # Plotting Histograms for Release Dates (Year-wise)
plt.figure(figsize=(12, 6))

sns.histplot(usa_playlist['year'], color='#2d63df', kde=True, bins=15,
             label='USA Playlist', stat='count')
sns.histplot(korea_playlist['year'], color='#ed392b', kde=True, bins=15,
             label='Korea Playlist', stat='count')

plt.title('Distribution of Track Releases Over Time in USA and Korea_
         ↳Playlists', fontsize=16)
plt.xlabel('Release Year', fontsize=12)
plt.ylabel('Number of Tracks Released', fontsize=12)
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



- The tracks in the Korean playlist are mostly more recent, with only one track released before 2022. This suggests a trend where Korean music, especially on Spotify, is more focused on the latest releases.
- The USA playlist, in contrast, has tracks spanning a wider period, including songs that were released as far back as 10 years ago. This indicates a more diverse selection in terms of track age, with older songs still maintaining their relevance in the playlist.
- Notably, both playlists show a surge in tracks released in 2024. The Korean playlist, while also having some tracks from 2024, it also has a large proportion of tracks released in 2022 and 2023, indicating that recent hits are dominating the playlist.

4 3. Business Recommendations

4.0.1 Summary of insights

Tracks - Only one overlap track (Jimin's Who), which indicates distinct preferences in the US and Korean playlists. - Tracks in the US playlist generally have higher popularity than those in the Korean playlist.

Ranking vs. Popularity - There's no strong correlation between track ranking and actual popularity, suggesting that ranking systems might not fully capture how popular a track is.

Artist - The US playlist features a more diverse set of artists, with no artist contributing more than 4 tracks. - The Korean playlist is dominated by a few key artists, particularly BTS and Lim Young Woong, showing BTS's major influence in Korea. - Lim Young Woong's popularity points to an expanding older demographic on Spotify in Korea. - Artist popularity scores in Korea show distinct peaks due to a few dominant artists, while the US playlist features more evenly distributed artist popularity.

Album - The US playlist is more diverse, with fewer albums dominating the playlist. - The Korean playlist has tracks from fewer albums, with certain albums like Jimin's MUSE contributing multiple tracks, highlighting the K-pop focus.

Track Duration - Similar track durations (~170 seconds or 3 minutes) across both playlists, indicating no major difference in track length.

Release Dates - The Korean playlist features mostly recent tracks, with only one track from before 2022. - The US playlist includes tracks from as far back as 10 years ago, showing a broader range of older and newer tracks, especially in 2024.

Music consumption is not the same in every country. By comparing Korean and US playlists, we gained insights into which genres, artists, and trends are more popular in each country. This helps Spotify to create more targeted strategies for content curation, advertising, and user acquisition.

4.0.2 For Spotify Korea: How to grow in Korea?

Targeting the Older Demographics:

The success of Lim Young Woong shows a growing interest in Trot music and older demographics in Korea. Spotify can expand its reach to these audiences by: - Curating More Trot Playlists: Create curated playlists that cater to older listeners, tapping into the growing popularity of this genre. - Collaborating with Trot Artists: Collaborating with influential Trot artists can help Spotify expand its listener base within this demographic. - Marketing Campaigns for Older Users: Tailor marketing campaigns to older audiences who may not be as familiar with Spotify, leveraging Lim Young Woong's popularity to drive adoption.

K-pop Expansion: Given the dominance of BTS and other K-pop groups, continue leveraging Spotify's relationship with K-pop to grow the platform: - Exclusive K-pop Content: Offering exclusive releases, interviews, or live sessions from popular K-pop artists can make Spotify the go-to platform for K-pop fans.

Increased Focus on Regional Music Trends: Expand the catalog to cover other regional genres beyond K-pop and Trot, such as hip-hop or indie, which may attract younger or more diverse listeners.

4.0.3 For Advertisers: What Does This Mean for Music Marketing?

Tailored Ads for Different Demographics: Given the diversity of listeners in both countries (younger Korean listeners versus older audiences in Korea), music marketers should segment their ads accordingly.

Localised Marketing: Create ads that cater specifically to the tastes of each country. For instance: - US Focus: More diverse, blending genres and featuring a wider variety of artists. - Korea Focus: More K-pop, Trot, and possibly indie genres, keeping in mind the rapidly shifting tastes toward newer tracks.

Leveraging Exclusive Content: Music marketing should emphasise exclusive content, such as behind-the-scenes videos, artist interviews, and live sessions. These exclusive elements can drive listener engagement and attract new subscribers: - K-pop Exclusives: Special content from popular artists like Jimin or BTS could create hype and drive new user sign-ups in markets beyond Korea. - Limited-Time Collaborations: Advertisers could work with Spotify to run campaigns where fans get early access to new releases or special promotions from top artists.